Garment for Use with Sensitive Skin, and Method and Fabric for Us in Making Same

Background

At one time or another, a large segment of the population suffers from sensitive skin or another skin disorder, including but not limited to atopic dermatitis, contact dermatitis, psoriasis, eczema, injury from burns, allergies, bedsores, etc. (Such ailments will be collectively referred to hereinafter as "sensitive skin".) As will be readily appreciated by such sufferers, the wearing of clothing can often cause great discomfort, due to the irritation resulting from the garments rubbing against the skin, seam irritation, and the like.

At least one attempt has been made to provide garments that are more comfortable to such sensitive skin sufferers. For example, one such product is made from yarns that are a blend of cotton and rayon with a chitosan additive. This product was touted as having a "softer hand" than cotton, superior moisture retention (that was purported to enable the fabric to hydrate the skin), and bacteriastatic activity. However, testing has indicated that the fabric had a Kawabata System surface roughness that was not significantly different from that of cotton fabrics, and that the fabrics did not exhibit any significant antimicrobial effect.

Currently, 100% cotton fabrics are recommended by dermatologists to their patients who suffer from sensitive skin. While providing greater comfort than many other garments, these fabrics still fail to provide optimal wearer comfort.

Summary of the Invention

The instant invention provides a fabric having a very low coefficient of friction in order that it does not irritate the skin. In addition, the fabric has the ability to transport moisture away from the skin, which has surprisingly been found to enhance the comfort of sensitive skin sufferers (contrary to prior understandings, as noted above with respect to the conventional fabrics designed for people with sensitive skin.) In addition, the fabric also desirably has an antimicrobial action, which is effective in preventing the growth of bacteria in the fabric.

In addition, the invention is directed to methods of making such fabrics, and garments made from the fabrics, which are specifically constructed such that when worn as a base layer, they enhance the comfort of sensitive skin sufferers. In addition, it is believed that the unique fabrics will facilitate the healing of the wearer's skin. Furthermore, the invention describes a method for enhancing the comfort of a person having sensitive skin. In addition, it is believed that the fabrics and garments of the invention may help prevent rashes and other skin irritations, by virtue of the superior combination of unique properties.

Detailed Description

In the following detailed description of the invention, specific preferred embodiments of the invention are described to enable a full and complete understanding of the invention. It will be recognized that it is not intended to limit the invention to the particular preferred embodiment described, and although specific terms are employed in describing the invention, such terms are used in a descriptive sense for the purpose of illustration and not for the purpose of limitation.

The fabrics of the instant invention are designed to have a very low coefficient of friction, in order to minimize skin irritation. Preferably, the fabrics have a dynamic coefficient of friction (as measured according to ASTM Test D1894-00, walewise and coursewise directions measured and averaged) of about 0.26 or less on the fabric surface designed to contact the skin (e.g. the fabric back), and more preferably less than about .23, when tested after five home washes. In addition, the fabrics also desirably have a low static coefficient of friction (as measured according to ASTM Test D1894-00, walewise and coursewise directions measured and averaged) of about 0.27 or less on the fabric surface designed to contact the skin (e.g. the fabric back), and more preferably less than about .25, when tested after five home washes. As illustrated below with the examples, this is a lower level of friction than those of cotton T-shirt fabrics. The fabric also desirably has a limberness that is greater than that of cotton, as evidenced by a lower bending measurement under the Kawabata system bending test (described below.)

The fabric also has the ability to transport excess moisture away from a wearer's skin at a level that is superior to a similar cotton fabric. This feature is evidenced below by the results to the vertical wicking, drop absorbency, and drying time. In addition, the moisture transported away from the fabric per unit time (i.e. drying rate) is greater than or equal to a comparable cotton fabric. As noted previously, this is opposite of prior fabrics designed for sensitive skin sufferers, which were typically designed to maintain moisture against the skin. Preferably, after five home washes, the fabrics have a vertical wicking of about 3 inches or greater after five minutes of test duration, a dry time from saturation of about 170 minutes or less (at 21 degrees C and 65% relative humidity) for a 62 cm square sample, when tested according to the test methods described below. Moisture transport during drying should be about .023 g/min/sq m or greater for the 62 cm square sample size.

The fabric also desirably has an antimicrobial action that will be effective in preventing the growth of bacteria in the fabric. This is achieved by providing the fabric with a functioning antimicrobial, which for purposes of this application is defined as an antimicrobial causing the fabric to have, after 5 home washings, a 2 log reduction or greater for Klebsiella Pneumoniae and Staphylococcus using the Vial Drop Method for Hydrophilic Textiles (described below.) This component is preferably topically applied to the fabric, such as by padding it onto the fabric. This antimicrobial action is desirably present through at least five home launderings of the product, and preferably through at least 25 home launderings. (For purposes of this application, whenever "home launderings" or "home washes" are specified, unless otherwise indicated, this means washing according to the wash method outlined in AATCC Test Method 135-1992 using powdered Tide® detergent, which is commercially available from Procter & Gamble.)

To this end, the fabric is preferably a knit fabric made from polyester yarns. In one embodiment of the invention, the fabric is knit from ring or jet spun yarns made from staple fibers of about 1.5 denier or less. The yarns preferably are about 27 cotton count or finer in size, and have a twist multiple of about 3.0-4.0. The fabrics are knit in a conventional manner using the above described yarns. Preferably, the fabric is at least 20 cut or greater (i.e., has 20 wales per inch or greater), and more preferably, the fabric has at least 24 wales per inch. The fabric is desirably circular knit, though it can also be flat knit, warp knit, or knit in some other manner, as will be readily appreciated by those of ordinary skill in art.

The fabric is then desirably scoured, treated with chemistries designed to impart characteristics such as moisture management, anti-pilling (where appropriate), whitening agents, soil release, chemistries designed to facilitate the manufacturing processes (e.g. defoamers) and the like. The fabric is then desirably heatset in a conventional manner (such as on a tenter), and an antimicrobial agent is then desirably applied. Preferably, the fabric is treated with

an antimicrobial composition, in a manner like that described in commonly-assigned U.S. Patent No. 6,575,574 to Child et al, U.S. Patent No. 6,584,668 to Green et al, and U.S. Patent Application Serial No. 09/586,381 to Green et al, filed June 2, 2000; Serial No. 09/586,053 to Li et al, filed June 2, 2000; Serial No. 09/586,081 to Green et al, filed June 2, 2000; Serial No. 10/146,642 to Green et al, filed May 15, 2002; Serial No. 10/439,130 to Green et al, filed May 15, 2003; Serial No. 09/589,179 to Green et al, filed June 2, 2000; Serial No. 10/146,684 to Green et al, filed May 15, 2002; Serial No. 10/437,601 to Green et al, filed May 14, 2003; Serial No. 09/585,762 to Van Hyning, filed June 2, 2000; Serial No. 10/307,027 to Kreider et al, filed November 29, 2002; and Serial No. 10/306,968 to Kreider et al, filed November 29, 2002, the disclosures of which are hereby incorporated by reference. More specifically, a mix is desirably prepared in water (preferably of low sodium content < 15 ppm), with about 1-5% polyurethane binder (e.g. Witcobond brand polyurethane available from Crompton Corp. of Middlebury, Connecticut), about 0.1-2% AlphaSan® antimicrobial (available from Milliken Chemical of Spartanburg, South Carolina), 0-4% of a hydrophilic agent (hydrophilic polyester dispersion such as Lubril QCJ available from Eastman Chemical), and 0-1% of a wetting agent (e.g. Igepal DAP-9, available from Rhodia North America). This formula is then desirably added to the fabrics with a wet pick up on dry fabric of 90-110% using a pad bath and nip rolls set at 35-40 psi. The fabrics where then dried at 220-260°F in a tenter. The finished fabric desirably has a weight of about 3.8 to about 5 oz/sq yard, a shrinkage of about 6% X 6% or less after 3 home washes, a pilling rating of about 3.0 or greater (after 5 home washes), and a soil release rating to corn oil of about 4.0 or greater (after 5 washes), and preferably has 27 or greater wales per inch and 38 or greater courses per inch (it being understood that the number of courses and wales per inch will be adjusted to account for the size of the yarns used and the knit construction).

In another embodiment of the invention, the fabric is knit from filament polyester yarns having a denier per filament of less than one (i.e. microdenier

yarns), and more preferably about 0.80 or less. The yarns are desirably false twist or air textured, and have a denier of about 160 or finer. The fibers are desirably untwisted. The fabrics are knit in a conventional manner, preferably on a 20 cut or greater circular knit machine. The fabrics are then scoured, processed in dye jet with one or more chemistries designed to optimize moisture management, optical brighteners, soil release agents, chemistries designed to facilitate the manufacturing processes (e.g. defoamers, etc.) and the like. The fabrics desirably have a finished weight of about 3.6-4.4 oz/sq yard, a shrinkage of about 6% X 6% or less after three home washes, a pilling rating of about 4.5 or greater (after 5 home washes) and a soil release of about 4.0 or greater (after 5 home washes), and has preferably has 27 or greater wales per inch and 38 or greater courses per inch (it being understood that the number of courses and wales per inch will be adjusted to account for the size of the yarns used and the knit construction).

EXAMPLES

Example A

A 28 cut fabric was jersey knit in a conventional manner from 27/1 ring spun yarns made from 1.5 dpf super-white round cross-section polyester having a 3.2 twist multiple. The fabric was then scoured and treated in a dye jet with dye chemistry including 1% defoamer, 0.75% isotridecycloxypropylaminopropylamine (an alkyl amine available from Tomah Products of Milton, WI in the manner described in commonly-assigned published U.S. Patent Application Serial No. 20030046771A1 to Kimbrell), 0.50% caustic at 50% concentration—hold at 274°F for one hour. The fabric was rinsed and dropped, then neutralized with 1% acetic acid at 84% concentration and dropped, then treated with .8% defoamer, .25% lubricant, .1% surfactant, 3% Lubril QCJ, .45% acetic acid at 84% concentration, and .15% optical brightener (all % are on weight of the fabric) and held at 266°F for 20 minutes. This was followed by a final rinse. The fabric was then heat set at 370°F at a speed of 30 yards per

minute. The fabric was heat set with an initial track width of 70 inches and an exit width was 70 inches overall. A mixture of 2.5% Witcobond polyurethane binder, 0.5% Igepal DAP-9, and 0.5% Alphasan® silver zirconium phosphate antimicrobial chemistry (available from Milliken Chemical of Spartanburg, South Carolina), with the balance of the formulation being water having a low sodium content (less than 15 parts per million), were applied via a pad using a wet pick up of 100%. The fabric was then passed through a tenter at a width of 70 inches at 240°F at a speed of 30 yards per minute, achieving a final width of 70 inches overall. The fabric had a finished weight of 4.3 oz/sq yard, and 35 wales per inch and 42 courses per inch.

Example B

A 28 cut fabric was jersey knit in a conventional manner from 150 denier (2/70/100) false twist textured yarns made from semi-dull round cross-section polyester. The fabric was then scoured. The fabric was then treated in a dye jet with a dye chemistry including 1% defoamer, .25% lubricant, .1% surfactant, 3% Lubril QCJ, .45% acetic acid at 84% concentration, and .15% optical brightener. The fabric was held at 266°F for 20 minutes and rinsed. All %s are on weight of fabric. The fabric was then heat set at 370°F at a speed of 30 yards per minute. The initial track width was 68 inches and the exit width was 68 inches overall. A mixture of 2.5% Witcobond polyurethane and 0.5% Alphasan® antimicrobial chemistry (available from Milliken Chemical of Spartanburg, South Carolina), .5% Igepal DAP-9 were applied via a pad using a wet pick up of 100%. The fabric was then passed through a tenter at a width of 68 inches at 240°F at a speed of 30 yards per minute, achieving a final width of 65 inches overall. The fabric had a finished weight of 3.86 oz/sq yard, and 38 wales per inch and 42 courses per inch.

Example C

Example C was a commercially available conventional 100% cotton T-shirt fabric (Jockey Classic, available from Jockey International of Kenosha, Wisconsin) of the variety typically recommended by dermatologists for wear by their patients with sensitive skin. The shirt was made from 28/1 ring spun combed cotton yarns, and had 34 wales per inch and 41 courses per inch.

TEST METHODS

Shrinkage: Fabric shrinkage was measured according to AATCC Test Method 135-1992 after five home washes at 105°F.

Pilling: Pilling was tested according to ASTM Test Method D-3512-02 after 60 minutes using a rating scale of 1-5 (5 being the best.)

Soil Release: Soil release for corn oil was tested according to AATCC Test Method 130-1995, using a 1-5 rating scale (5 being the best.)

Dynamic Coefficient of Friction: Dynamic coefficient of friction was measured according to ASTM Test Method D1894-00. The back of the fabric (which will be the skin-contacting surface) was tested in each of the walewise and coursewise directions for 48 samples per fabric, and the measurements were averaged.

Static Coefficient of Friction: Static coefficient of friction was measured according to ASTM Test Method D 1894-00. The back of the fabric (which will be the skin-contacting surface) was tested in each of the walewise and coursewise directions for 48 samples per fabric, and the measurements were averaged.

Drop Absorbency: Drop absorption was tested using the following Drop Absorbency test. (modified AATCC Test Method 39-1980.) The test is designed for the quick evaluation of wettability. The principle is that a drop of water is allowed to fall from a given height onto the surface of a taut test specimen. The timer required for the water drop to be completely absorbed by the fabric is measured and recorded. The test requires a straight medicine dropper delivering 15-25 drops per milliliter, a stop watch or equivalent timer, distilled or demineralized water, and an embroidery hoop. Fabric specimens are allowed to reach equilibrium with the environment of the testing area. A sample large enough to test three different areas is required (preferably a full width sample.) The sample is identified as to whether it is "as received" or the number of washes before testing. The procedure of the 39-1980 was followed, with the medicine dropper being used in place of the burette of the test method, and the height of the dropper was one inch (vs. 3/8 inch.)

Vertical Wicking: Vertical wicking was tested after five minutes according to the following Vertical Wicking Test procedure. The purpose of the test was to determine the rate at which water will wick on test specimens suspended in water. The test requires 500 ml Erlenmeyer flasks, straight pins (approximately 3 inches in length), and food coloring (any color to make water level visible on specimen. The procedure is as follows: Fill 500 ml Erlenmeyer flasks with 200 ml colored water (fill as many flasks as specimens to be tested.) Cut 6 inch by 1 inch strip of specimens to be tested (6 inch length is cut in the wale direction of the fabric.) Pierce the top edge of the strip (approximately 1/8-1/4 inch from the top) with a long straight pin so that the pin runs parallel with the short fabric dimension. Suspend the strip from the pin in a flask filled with the colored water, so that the fabric touches the water. After one minute, remove the strip from the flask, measure the water level on the strip in inches and record, and return the strip to the water. Repeat the removal and measurement steps at 3 minutes and 5 minutes, and at each minute thereafter until the water level reaches 6 inches or one hour has elapsed.

Drying Time and Drying Rate: To determine the drying time and drying rate, standard GATS test was first performed. All tests were performed at 21°C and 65% relative humidity using the Gravimetric Absorbency Testing System ("GATS"). This test system is well known to those of ordinary skill in the art, and is available at a variety of places, including the Center for Research on Textile Protection and Comfort and North Carolina State University College of Textiles (Raleigh, North Carolina.) Using the GATS, the fluid was absorbed radially outward along the plane of the sample from a single point of ¼ inch diameter in the bottom of a circular porous test plate. The samples were die-cut from test fabrics with a circular die of 3.5 inch diameter (62 cm^2) and weighed. The GATS is interfaced with a high-speed data acquisition system. Output from the GATS balance is automatically collected, displayed and evaluated by LabView ®software, which provides a plot of the amount of fluid absorbed as a function of time.

To conduct a test, a special specimen cell and cover was used. The test specimen is positioned on the plate that contains numerous fine pores. This permits the test specimen to contact the entire area, and thus provides a more accurate simulation of a fabric in contact with sweat wetted skin.

A special cover is used to induce transport of fluid through the thickness and evaporation from the surface. The cover has 54, 3-inch long pins uniformly distributed over the area of the test space. These pins act to separate the cover plate from the fabric sample and permit air to circulate over the surface of the test sample. The amount of fluid lost from the reservoir is recorded as a function of test duration. There is a 2 mm diameter hole at the bottom center of this porous plate that is connected to a fluid reservoir. The level of the cell is adjusted to give zero hydrostatic head. This guarantees that absorbency takes place strictly on demand. A solenoid valve supplies fluid from the fluid reservoir equal to the amount the specimen can absorb. A fluid sensor automatically weighs the amount of water supplied. The characteristic output can be explained as follows:

once the fabric sample is placed on the porous plate, it imbibes fluid until the fabric becomes saturated. Absorption behavior is evidenced by the rapid rate of fluid loss, indicated by the high slope in the initial phase of the test. After the absorption phase, moisture transfer occurs by evaporation, with some absorption to replace fluid losses.

From the output, maximum absorbent capacity, C and flow rate, Q_o, are determined. Also, specific flow rate, Q, is calculated by dividing the flow rate, Q_o, by the weight of the dry fabric (grams fluid/grams dry fabric·min). Specific details are given below.

Experimental conditions:

Test fluid: distilled water.

Parameters:

measurement parameters include:

W_d dry weight of the conditioned sample specimen, grams

W_w wet weight of the sample specimen at the end of the test, grams

V amount of water passed from the reservoir during 1000 seconds, grams

T time, min

This is the point where the extrapolated absorption and evaporation areas of the curve intersect.

The reported absorption parameters calculated from the above measurements include:

C absorbent capacity, grams, $(W_w - W_d)$

The amount of water contained in the sample at the end of the test.

Q absorbency rate, g/min

The rapid rate of fluid loss, indicated by the high slope of the initial phase of the test.

Evaporation is calculated from the above measurements:

E_p percent evaporation, (V – C/V)* 100

Drying rate and drying time testing were performed after completion of the GATS testing. Dry time was calculated after first determining the absorbent capacity of the fabric (using the GATS test described above). The test is performed to determine the drying properties (drying rate or time until dry) of saturated fabric. The exact amount of water to add to the fabric sample is determined by the calculated absorbent capacity determined in the test above. Again, the dry weight of the sample specimen is determined. The averaged maximum absorption capacity value obtained during the demand wettability test is used as initial amount of water applied to fabric. After the water has saturated the fabric the wet weight is recorded, airflow, across the plate, of 1.5 m/s is set, and timing is started. Weight is recorded after 10-minute intervals. When the weight is constant for 3 successive readings, the final weight is determined. Reported parameters are:

W_d the conditioned weight of fabric before test, grams

W_w weight of saturated fabric at the beginning of the test, grams

T_d duration for fabric to dry from saturation, min

Dry rate was calculated by taking the amount of moisture driven off the fabric per unit time, and converting to a square meter basis.

<u>Bending Force</u>: Bending force (B) was measured using the Kawabata Evaluation System ("Kawabata System"). The Kawabata System was developed by Dr. Sueo Kawabata, Professor of Polymer Chemistry at Kyoto University in Japan, as a scientific means to measure, in an objective and reproducible way, the "hand" of textile fabrics. This is achieved by measuring basic mechanical properties that have been correlated with aesthetic properties relating to hand (e.g. smoothness, fullness, stiffness, softness, flexibility, and crispness), using a set of four highly specialized measuring devices that were developed specifically for use with the Kawabata System. These devices are as follows:

Kawabata Tensile and Shear Tester (KES FB1)

Kawabata Pure Bending Tester (KES FB2)
Kawabata Compression Tester (KES FB3)
Kawabata Surface Tester (KES FB4)

KES FB1 through 3 are manufactured by the Kato Iron Works Col, Ltd., Div. Of Instrumentation, Kyoto, Japan. KES FB4 (Kawabata Surface Tester) is manufactured by the Kato Tekko Co., Ltd., Div. Of Instrumentation, Kyoto, Japan. In each case, the measurements were performed according to the standard Kawabata Test Procedures, with four 8-inch X 8-inch samples of each type of fabric being tested, and the results averaged. Care was taken to avoid folding, wrinkling, stressing, or otherwise handling the samples in a way that would deform the sample. The die used to cut each sample was aligned with the yarns in the fabric to improve the accuracy of the measurements. A lower value means a fabric is less stiff. Twelve samples were taken in each of the coursewise and walewise directions of the fabric back, averaged for all, and are listed below. All samples had been home washed five times prior to testing.

Antimicrobial Activity: Antimicrobial activity was tested for Staphylococcus aureus and Klebsiella Pneumoniae using the Vial Drop Method for Hydrophilic Textiles (modified AATCC Method 100-1999.) The method, which measures the reduction in viability of a suspension of bacteria in contact with textiles or other absorbent articles, is described below. An overnight culture of a selected bacterial strain is diluted into 100 mM sodium/potassium phosphate buffer to a concentration of ca. $5x10^5$ cells/ml. The viability of the inoculated sample is enumerated with a Serial Dilution-Nutrient Agar Plate Method or "Most-probable Number Technique." A drop (0.5 ml) of the diluted culture is added to a glass vial containing 0.5 g of sample (fabric samples are cut into 1x1 cm pieces) and a separate vial containing 0.5 g of an untreated control. The treated sample and untreated control are then incubated at 37°C for 18-22 hrs in a high humidity environment. Following incubation, 10 ml of Tryptic Soy Broth with 0.2% of a non-ionic surfactant are added to the vials followed by vigorous agitation to

remove the viable cells from the surface for the textile sample. The number of viable bacteria in the wash solution is enumerated with a Serial Dilution-Nutrient Agar Plate Method or Most-probable Number Technique. Efficacy is expressed as: [Log (# of viable cells/ml from the untreated control) – Log (# of viable cells/ml from the treated sample)]. In all studies with this method, the number of viable cells after exposure to the treated samples is compared to the number of viable cells after exposure to a standard untreated polyester (PET) fabric control. The maximum log reduction that can be measured in the test is a function of the number of viable cells in contact with the internal control after 18-22 hrs and the minimum number of viable cells that can be recovered from the sample. Testing was conducted on fabrics both prior to and after they had been home washed five times.

K. pneumoniae (LR = Log Reduction)

#	Sample ID	LR Trial #1	LRTrial #2	LR Avg	LR Stdev
Viability		9.30E +04	8.00E+04	8.65E+04	9.19E+03
Internal control		-2.47	-1.98	-2.23	0.35
1	Ex. A 0 wash	5.73	5.18	5.46	0.39
2	Ex A 5 wash	3.17	1.84	2.51	0.94
3	Ex B 0 wash	5.73	5.18	5.46	0.39
4	Ex. B 5 wash	1.93	5.18	3.55	2.30
	Maximum Value	5.73	5.18	5.46	0.39

S. aurues

#	Sample ID	LR Trial #1	LRTrial #2	LR Avg	LR Stdev
Viability		7.40E + 05	8.80E + 06	4.77/e+06	5.70E+06
Internal control		0.20	1.28	0.74	0.76
1	Ex. A 0 wash	2.81	2.31	2.56	0.35
2	Ex A 5 wash	2.39	2.81	2.60	0.29
3	Ex B 0 wash	2.31	2.31	2.31	0.00
4	Ex. B 5 wash	2.31	3.96	3.13	1.17
	Maximum Value	3.96	3.96	3.96	0.00

Test	Ex. A	Ex. B	Ex. C
Shrinkage (walewise X coursewise)	5.8% X 4.8%	4.0% X 2.5%	6.8% X 3.5%
Pilling	3.5 after 60 min.	5.0 after 60 min.	5.0 after 60 min.
Soil Release	4.8	4.2	5.0
Drop Absorbency (after 5 home washings)	1 second	1 second	1 second
Vertical Wicking	3.7 inches after 5	5.2 inches after 5	3.7 inches after 5

(after 5 home washings)	minutes	minutes	minutes
Dry Time (at 21°C and 65% Relative Humidity) (after 5 home washings)	160.5 minutes	92 minutes	189 minutes
Drying Rate (after 5 home washings)	.024 g/min/sq m	.030 g/min/sq m	.022 g/min/sq m
Dynamic Coefficient of Friction	0.221	0.205	0.336
Static Coefficient of Friction	0.248	0.237	0.338
Bending Force	.010 gf-cm^2/cm	.008 gf-cm^2/cm	.024 gf- cm^2/cm
Klebsiella pneumoniae	2.3 log reduction	2.3 log reduction	N/A
Staphylococcus aureus	2.5 log reduction	3.5 log reduction	N/A

The garments are preferably sewn with flat lock seams in order that the seams are not a source of irritation to the wearer. The garments would also preferably use labels that are heat sealed or heat transfer printed to minimize irritation to the wearer.

The fabrics of the invention can be used in any end use where the fabrics will contact the skin, including but not limited to clothing, sheeting, undergarments,

etc. (For purposes of this application, the term "base layer garment" indicates a garment intended to be worn next to a wearer's skin.)

In the specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purpose of limitation, the scope of the invention being defined in the claims.